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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,359	03/25/2005	Alexei Gorokhov	NL 020978	6167
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EXAMINER				
LIM, STEVEN				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,359

Applicant(s)

GOROKHOV ET AL.

Examiner

STEVEN LIM

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8,10,15 and 16 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1,2,4-8,10,15 and 16 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: A transmission system for transmitting an information signal via a plurality of subchannels from a transmitter to a receiver.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 15 and 16 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent and recent Federal Circuit decisions indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim recites a series of steps or acts to be performed, the claim neither transforms underlying subject matter nor is positively tied to another statutory category that accomplishes the claimed method steps, and therefore does not qualify as a statutory process. For example the transmitting an information signal method

including steps of demultiplexing, encoding, multiplexing, interleaving, channel encoding, and transmitting is of sufficient breadth that it would be reasonably interpreted as a series of steps completely performed mentally, verbally or without a machine.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1, 2, 4-8, 10, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giannakis et al. (Giannakis) (US 7292647) in view of Park et al. (US 6442152).

7. Regarding claim 1, Giannakis discloses a transmission system for transmitting an information signal via a plurality of subchannels from a transmitter to a receiver, the transmitter comprising: a demultiplexer for demultiplexing the information signal into a

plurality of information subsignals in dependence on a throughput of the subchannels as ordered by the receiver; an encoder for encoding input symbols of the information subsignals into output symbols such that k input symbols of the k -th information subsignal are encoded with a k -times- m -code into m output symbols, $1 \leq k \leq K$, said code having the following properties: all k input symbols and all $m-k$ other output symbols are determinable from any k output symbols, and no $m-l$ other output symbols are determinable from any l output symbols, $l < k$, a multiplexer for multiplexing the output symbols into output information subsignals; a channel encoder for channel encoding the output information subsignals into encoded information subsignals; and means for transmitting each encoded information subsignal via one of the subchannels to the receiver; the receiver comprising: means for receiving the encoded information subsignals; a channel decoder for successively channel decoding the received encoded information subsignals into channel decoded information subsignals by incorporating decoding information of already channel decoded information subsignals; a demultiplexer for demultiplexing the channel decoded information subsignals into channel decoded symbols; a decoder for decoding the channel decoded symbols into decoded output symbols and for supplying the decoding information regarding the decoded output symbols to the channel decoder; a further multiplexer for multiplexing the decoded output symbols into an output information signal (col. 2, line 13 to col. 3, line 7 and col. 3, lines 46-60 and col. 5, line 44 to col. 6, line 3), however Giannakis fails to disclose an interleaver interleaving the output and the channel encoder encoding the interleaved output.

8. In an analogous art, Park et al. discloses an interleaver and a channel encoder where the interleaver interleaves the output of the channel encoder (Col. 7, Lines 46-57), which enables a randomization of burst errors.

9. It would have been obvious to one having ordinary skill in the art at the time of invention was made to include an interleaver in order to enable randomization of burst errors and to place it between the multiplexer and channel encoder because the interleaver works independently of the other functions and it has been held that rearranging parts of an invention involved only routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950).

10. Regarding claim 2, Giannakis discloses the transmission system according to claim 1, wherein the code is a maximum distance separable (MDS) code (col. 13, lines 50-60).

11. Regarding claim 4, Giannakis discloses the transmission system according to claim 1, wherein the channel decoder is arranged for decoding a received encoded information subsignal by incorporating decoding information of the most recently channel decoded information subsignal (col. 2, line 13 to col. 3, line 7 and col. 3, lines 46-60 and col. 5, line 44 to col. 6, line 3).

12. Regarding claim 5, Giannakis discloses the transmission system according to claim 1, wherein the transmission system is a binary transmission system and wherein the information subsignals comprise differently routed binary signals (col. 2, line 13 to col. 3, line 7 and col. 3, lines 46-60 and col. 5, line 44 to col. 6, line 3).

13. Regarding claim 6, Giannakis discloses the transmission system according to claim 1, wherein the transmission system is a wireless communication system, and wherein the transmitter comprises a plurality of transmit antennas, wherein each channel encoded information subsignal is transmitted via one of the transmit antennas to the receiver, and wherein the receiver comprises a plurality of receive antennas for receiving the encoded information subsignals.

14. Regarding claim 7, Giannakis discloses a transmitter for transmitting an information signal via a plurality of subchannels to a receiver, the transmitter comprising: a demultiplexer for demultiplexing the information signal into a plurality of information subsignals in dependence on a throughput of the subchannels as ordered by the receiver; an encoder for encoding input symbols of the information subsignals into output symbols such that k input symbols of the k -th information subsignal are encoded with a k -times- m -code into m output symbols, $1 \leq k \leq K$, said code having the following properties: all k input symbols and all $m-k$ other output symbols are determinable from any k output symbols, and no $m-k$ other output symbols are determinable from any k output symbols, $k < m$; a multiplexer for multiplexing the output symbols into output information subsignals; a channel encoder for channel encoding the output information subsignals into encoded information subsignals; and means for transmitting each encoded information subsignal via one of the subchannels to the receiver (col. 2, line 13 to col. 3, line 7 and col. 3, lines 46-60 and col. 5, line 44 to col. 6, line 3), however Giannakis fails to disclose an interleaver interleaving the output and the channel encoder encoding the interleaved output.

15. In an analogous art, Park et al. discloses an interleaver and a channel encoder where the interleaver interleaves the output of the channel encoder (Col. 7, Lines 46-57), which enables a randomization of burst errors.

16. It would have been obvious to one having ordinary skill in the art at the time of invention was made to include an interleaver in order to enable randomization of burst errors and to place it between the multiplexer and channel encoder because the interleaver works independently of the other functions and it has been held that rearranging parts of an invention involved only routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950).

17. Regarding claim 8, Giannakis discloses the transmitter according to claim 7, wherein the code is a maximum distance separable (MDS) code(col. 13,lines 50-60).

18. Regarding claim 10, Giannakis discloses the transmitter according to claim 7, wherein the transmitter comprises a plurality of transmit antennas, and wherein each channel encoded information subsignal is transmitted via one of the transmit antennas to the receiver(col. 2,line 13 to col. 3,line 7 and col. 3,lines 46-60 and col. 5,line 44 to col. 6,line 3).

19. Regarding claim 15, Giannakis discloses a method of transmitting an information signal via a plurality of subchannels to a receiver, the method comprising:
demultiplexing the information signal into a plurality of information subsignals in dependence on a throughput of the subchannels as ordered by the receiver; encoding input symbols of the information subsignals into output symbols such that k input symbols of the k-th information subsignal are encoded with a k.times.m-code into m

output symbols, $1 \leq k \leq m$, said code having the following properties: all k input symbols and all $m-k$ other output symbols are determinable from any k output symbols, and no $m-l$ other output symbols are determinable from any l output symbols, l less than k and multiplexing the output symbols into output information subsignals; channel encoding the output information subsignals into encoded information subsignals; transmitting each encoded information subsignal via one of the subchannels to the receiver (col. 2, line 13 to col. 3, line 7 and col. 3, lines 46-60 and col. 5, line 44 to col. 6, line 3) , however Giannakis fails to disclose an interleaver interleaving the output and the channel encoder encoding the interleaved output.

20. In an analogous art, Park et al. discloses an interleaver and a channel encoder where the interleaver interleaves the output of the channel encoder (Col. 7, Lines 46-57), which enables a randomization of burst errors.

21. It would have been obvious to one having ordinary skill in the art at the time of invention was made to include an interleaver in order to enable randomization of burst errors and to place it between the multiplexer and channel encoder because the interleaver works independently of the other functions.

22. Regarding claim 16, Giannakis discloses the method of transmitting according to claim 15, wherein the code is a maximum distance separable (MDS) code (col. 13, lines 50-60).

Response to Arguments

23. Applicant's arguments with respect to claims 1, 2, 4-8, 10, 15, and 16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVEN LIM whose telephone number is (571)270-1210. The examiner can normally be reached on Mon-Thurs 9:00am-4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571)272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. L./
Examiner, Art Unit 2617

/Lester Kincaid/
Supervisory Patent Examiner, Art Unit 2617